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(54) ADHESIVE SHEET FOR SURFACE PROTECTION

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an adhesive sheet for a surface-protection use capable of imparting to the surface of an imaging paper for photograph, etc., outputted by a printer, excellent scratch resistance, water resistance and chemical resistance and improving the sharpness of the image.

SOLUTION: The adhesive sheet is produced by laminating a releasing agent layer, a resin layer curable with ionizing radiation and having a thickness of 3-30 μm and a tacky adhesive layer of 1-30 μm thick on one surface of a plastic film.

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CLAIMS

[Claim(s)]

[Claim 1] The pressure sensitive adhesive sheet for surface protections characterized by carrying out the laminating of a release agent layer, an ionizing-radiation hardening resin layer with a thickness of 3-30 micrometers, and the binder layer with a thickness of 1-30 micrometers to one front face of a plastic film.

[Claim 2] The pressure sensitive adhesive sheet for surface protections according to claim 1 with which the release agent layer contains alkyd resin or polyolefin resin.

[Claim 3] The pressure sensitive adhesive sheet for surface protections according to claim 1 or 2 with which an ionizing-radiation hardening resin layer stiffens the ionizing-radiation hardenability matter with which with a number average molecular weight of 3000 or more 2 organic-functions urethane (meta) acrylate and the number of functional groups consist of mixture of three or more polyfunctional (meta) acrylate.

[Claim 4] The pressure sensitive adhesive sheet for surface protections according to claim 1 to 3 with which the release agent layer front face is a fine concavo-convex configuration.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[The technical field to which invention belongs] This invention relates to image papers, such as a photograph outputted by printers, such as a color printer, and the pressure sensitive adhesive sheet for surface protections stuck on front faces, such as a display panel.

[0002]

[Description of the Prior Art] In recent years, the technological innovation of a color printer is remarkable and the clear nature of images, such as a photograph outputted, and minute nature already have level almost equivalent to the conventional development film photograph. However, image papers, such as a photograph outputted by the printer, have the problem that abrasion-proof nature, a water resisting property, and chemical resistance are inferior in a front face compared with a development film photograph. Furthermore, with large surfacing, abrasion-proof nature, a water resisting property, and chemical resistance are stronger still, and image papers, such as a photograph outputted by the printer, are requested from a front face. Since it corresponds to this want, it is possible to stick a protection film on the front face of image papers, such as a photograph outputted by the printer. However, if the conventional protection film is stuck on image papers, such as a photograph outputted by the printer, although a water resisting property and chemical resistance can be given, abrasion-proof nature is not enough and there is a problem to which the clear nature of an image falls from the thickness.

[0003]

[Problem(s) to be Solved by the Invention] This invention can give the abrasion-proof nature excellent in front faces, such as image papers, such as a photograph outputted by the printer, a water resisting property, and chemical resistance, and aims at offering the pressure sensitive adhesive sheet for surface protections which can raise the clear nature of an image further.

[0004]

[Means for Solving the Problem] In order that this invention person may solve the above-mentioned technical problem, as a result of inquiring wholeheartedly, on one front face of a plastic film A release agent layer, an ionizing-radiation hardening resin layer, and a binder layer are made the configuration which carried out the laminating one by one. The plastic film with a release agent layer By being used in order to form an ionizing-radiation hardening resin layer, making it the configuration which can exfoliate easily, after the pressure sensitive adhesive sheet for surface protections is stuck on adherend, and making it further the thin range of specification [the thickness of an ionizing-radiation hardening resin layer and a binder layer] It finds out that the above-mentioned technical problem is solvable, and came to complete this invention. That is, this invention offers the pressure sensitive adhesive sheet for surface protections characterized by carrying out the laminating of a release agent layer, an ionizing-radiation hardening resin layer with a thickness of 3-30 micrometers, and the binder layer with a thickness of 1-30 micrometers to one front face of a plastic film. Moreover, this invention offers the pressure sensitive adhesive sheet for surface protections with which the release agent layer contains alkyd resin or polyolefin resin in the above-mentioned pressure sensitive adhesive sheet for surface

protections.

[0005] Moreover, this invention offers the pressure sensitive adhesive sheet for surface protections with which an ionizing-radiation hardening resin layer stiffens the ionizing-radiation hardenability matter with which with a number average molecular weight of 3000 or more 2 organic-functions urethane (meta) acrylate and the number of functional groups consist of mixture of three or more polyfunctional (meta) acrylate in the above-mentioned pressure sensitive adhesive sheet for surface protections.

Moreover, this invention offers the pressure sensitive adhesive sheet for surface protections with which the release agent layer front face of a plastic film is a fine concavo-convex configuration in the above-mentioned pressure sensitive adhesive sheet for surface protections.

[0006]

[Embodiment of the Invention] In the pressure sensitive adhesive sheet for surface protections of this invention as a plastic film For example, polyethylene system resin, such as high density polyethylene, medium density polyethylene, and low density polyethylene, Polypropylene resins, such as polypropylene, poly methyl-1-pentene / ethylene / annular olefine copolymer, Polyolefin resin, such as an ethylene-vinylacetate copolymer, nylon 6, nylon 6, 6, nylon 6, 10, nylon 6, the polyamide resin of 12 grades, Polyethylene terephthalate, polybutylene terephthalates, those copolymers, Polyester resin, such as polyethylenenaphthalate and aliphatic series polyester, Although films, such as polycarbonate resin, polystyrene resin, polyphenylene sulfide resin, polyvinyl chloride resin, polyimide, fluororesin or a copolymer containing these either, a polymer blend, and a polymer alloy, can be used The film of polyester resin and polyolefin resin is used preferably. Although especially the thickness of a plastic film is not limited, it is usually about 10-300 micrometers.

[0007] The release agent layer in the pressure sensitive adhesive sheet for surface protections of this invention is constituted by the release agent. As a release agent, although various release agents can be used, alkyd resin, silicone resin, polyolefin resin, etc. are mentioned. A release agent may be used by the one-sort independent, and may mix and use two or more sorts. As a release agent, alkyd resin and polyolefin resin are desirable. As alkyd resin, the modified alkyd resin which is a condensation polymer (straight alkyd resin) with a glycerol, a phthalic acid, or phthalic anhydride and the denaturation object of straight alkyd resin is mentioned. As modified alkyd resin, acrylic modified alkyd resin, rosin modified alkyd resin, phenol modified alkyd resin, urethane modified alkyd resin, etc. are mentioned. As alkyd resin, acrylic modified alkyd resin is [among these] desirable.

[0008] In addition, alkyd resin may be made to mix silicone resin. When mixing and using alkyd resin and silicone resin, the blending ratio of coal of alkyd resin has desirable 70 - 95 mass %. Moreover, as polyolefin resin, polyethylene resin, polypropylene resin, ethylene-propylene copolymerization resin, polybutene resin, etc. are mentioned. Polyethylene resin is [among these] desirable. It is usually 30 micrometers or less, the thickness of a release agent layer has desirable 0.01-25 micrometers, and especially its 0.1-20 micrometers are desirable. When the release agent layer front face was a fine concavo-convex configuration, and the front face of an ionizing-radiation hardening resin layer can also be made into a fine concavo-convex configuration and stuck on image papers, such as a photograph, it can be made the lusterless type pressure sensitive adhesive sheet for surface protections which can frost the front face of images, such as a photograph. The surface roughness of a fine concavo-convex configuration has desirable 0.15-0.5 micrometers at arithmetical mean deviation of profile (Ra), and especially its 0.2-0.4 micrometers are desirable. As an approach of making a release agent layer front face a fine concavo-convex configuration, embossing is performed to a release agent layer front face, or approaches, such as carrying out spreading formation of the release agent layer thinly, are mentioned to the front face of the plastic film of the concavo-convex configuration where a front face is fine.

[0009] The ionizing-radiation hardening resin layer in the pressure sensitive adhesive sheet for surface protections of this invention applies the hardenability constituent containing the ionizing-radiation hardenability matter, irradiates ionizing radiation, stiffens it, and can be formed. It hardens, when the ionizing-radiation hardenability matter can irradiate ionizing radiation, and the constituent containing a partial saturation monomer, oligomer, resin, or them etc. is mentioned. As the example, the acrylic compound of the radiation-curing mold of the many organic functions which have two or more

functional groups, such as acrylate (meta), urethane (meta) acrylate, and polyester (meta) acrylate, is mentioned. As acrylate, ethylene GURIKORUJI (meta) acrylate, (Meta) Propylene GURIKORUJI (meta) acrylate, butylene GURIKORUJI (meta) acrylate, Neopentyl GURIKORUJI (meta) acrylate, hexane JIORUJI (meta) acrylate, Trimethylolethane tri(metha)acrylate, TORIMECHI roll pro pantry (meta) acrylate, Pen TAERISURITORUTORI (meta) acrylate, pentaerythritol tetrapod (meta) acrylate, Dipentaerythritol PENTA (meta) acrylate, dipentaerythritol hexa (meta) acrylate, GURISERIRUTORI (meta) acrylate, triaryl (meta) acrylate, bisphenol A ethylene oxide denaturation di(meth)acrylate, etc. are desirable.

[0010] The acrylate by which the acryloyl (meta) radical is combined with polyol through the urethane bond as urethane (meta) acrylate (meta) is mentioned, and a reactant with polyol, diisocyanate, and hydroxyl-group content (meta) acrylate is usually mentioned. As polyol, polyether polyol, polyester polyol, etc. are mentioned and polyether polyol is desirable. Moreover, although aliphatic series polyol, aromatic series polyol, etc. are mentioned, aliphatic series polyol of polyol is desirable. As diisocyanate, although aromatic series diisocyanate, aliphatic series diisocyanate, alicycle group diisocyanate, etc. are mentioned, aliphatic series diisocyanate and alicycle group diisocyanate are desirable. As hydroxyl-group content (meta) acrylate, although hydroxy aryl (meta) acrylate, hydroxyalkyl (meta) acrylate, hydroxy cycloalkyl (meta) acrylate, etc. are mentioned, hydroxyalkyl (meta) acrylate is desirable. In addition, what used diol as polyol is mentioned as 2 organic-functions urethane (meta) acrylate. The ionizing-radiation hardenability matter may be used by the one-sort independent, and may be used combining two or more sorts. Moreover, vinyl compounds, such as styrene and vinyl pyrrolidone, may be used together and used according to a request.

[0011] With a number average molecular weight of 3000 or more 2 organic-functions urethane (meta) acrylate and the number of functional groups have [the ionizing-radiation hardenability matter] the desirable mixture of three or more polyfunctional (meta) acrylate. The 10 - 200 mass section has [three or more polyfunctional (meta) acrylate] the desirable number of functional groups to the with a number average molecular weight of 3000 or more 2 organic-functions urethane (meta) acrylate 100 mass section, and especially the 20 - 150 mass section is desirable. As for the number average molecular weight of 2 organic-functions urethane (meta) acrylate, 3000-20000 are more desirable, and 4000-especially 10000 are desirable. Moreover, as for the number of functional groups of three or more polyfunctional (meta) acrylate, 3-8 are [the number of functional groups] desirable, and 3-especially 6 are desirable. The number of functional groups is mentioned for trimethylolethane tri(metha)acrylate, TORIMECHI roll pro pantry (meta) acrylate, pen TAERISURITORUTORI (meta) acrylate, pentaerythritol tetrapod (meta) acrylate, dipentaerythritol PENTA (meta) acrylate, dipentaerythritol hexa (meta) acrylate, GURISERIRUTORI (meta) acrylate, etc. as an example of three or more polyfunctional (meta) acrylate. A hardenability constituent can make solvents, such as photopolymerization initiators, such as an acetophenone, 1-hydroxy cyclohexyl phenyl ketone, 2-methyl-1-[4-(methylthio) phenyl]-2-morpholinopropane-1-ON, and benzoin methyl ether, and toluene, 1-methoxy-2-propanol, isopropyl alcohol, methyl isobutyl ketone, contain. As for the surface hardness of an ionizing-radiation hardening resin layer, it is desirable that a pencil degree of hardness is more than H. Moreover, less than 5mm of 10 g/phi is desirable at a probe tuck (JIS Z0237), as for an ionizing-radiation hardening resin layer, it is desirable not to have a tuck on a front face, and, specifically, it is [less than 5mm of 1 g/phi is more desirable, and] desirable that it is especially 5mm of 0 g/phi. The thickness of an ionizing-radiation hardening resin layer is 3-30 micrometers, and its 5-20 micrometers are desirable.

[0012] In this invention, in order to raise the clear nature of an image, as for an ionizing-radiation hardening resin layer, it is desirable to have transparency. An ionizing-radiation hardening resin layer applies the hardenability constituent containing the ionizing radiation hardenability matter to the front face of a release agent layer usually prepared on the surface of the plastic film, and is formed in it by irradiating the spreading film and making it harden ionizing radiation. As for ionizing radiation, ionizing radiation, such as an electron ray and ultraviolet rays, is contained. That the dose of ionizing radiation should just be an amount which the hardenability matter hardens, although there is especially no limit, in the case of UV irradiation, it usually irradiates with an ultraviolet ray lamp etc. in the range of an

illuminance 50 - 300 mW/cm², and the quantity of light 30 - 800 mJ/cm², for example.

[0013] In this invention, the binder layer is prepared in the front face of an ionizing-radiation hardening resin layer. As for the binder used for a binder layer, for example, a natural rubber system binder, a synthetic-rubber system binder, an acrylic resin system binder, a polyvinyl ether resin system binder, a urethane resin system binder, a silicone resin system binder, etc. are mentioned. As an example of a synthetic-rubber system binder, styrene-butadiene-rubber, polyisobutylene rubber, isobutylene-polyisoprene-rubber, polyisoprene-rubber, styrene-isoprene block-copolymer, styrene-butadiene block-copolymer, styrene-ethylene-butylene block-copolymer, and ethylene-vinyl acetate thermoplastic elastomer etc. is mentioned. As an example of an acrylic resin system binder, a homopolymer or copolymers, such as an acrylic acid, a methyl acrylate, an ethyl acrylate, acrylic-acid propyl, butyl acrylate, 2-ethylhexyl acrylate, a methyl methacrylate, ethyl methacrylate, methacrylic-acid butyl, and acrylonitrile, etc. are mentioned. Polyvinyl ether, polyvinyl isobutyl ether, etc. are mentioned as an example of a polyvinyl ether resin system binder. Dimethylpolysiloxane etc. is mentioned as an example of a silicone resin system binder. These binders are one-sort independent, or can be used combining two or more sorts.

[0014] Moreover, coloring agents, such as a tackifier, a softener, an antioxidant, a loading material, a color, or a pigment, etc. can be blended with the above-mentioned binder layer if needed. As a tackifier, rosin system resin, terpene phenol resin, terpene resin, aromatic hydrocarbon denaturation terpene resin, petroleum resin, coumarone-indene resin, styrene resin, phenol system resin, xylene resin, etc. are mentioned. Process oil, liquid rubber, a plasticizer, etc. are mentioned as a softener. A silica, talc, clay, a calcium carbonate, etc. are mentioned as a loading material. The thickness of a binder layer is 1-30 micrometers, and is 2-10 micrometers preferably.

[0015] After a binder layer may direct-apply a binder to an ionizing-radiation hardening resin layer, and may form it in it, and makes the remover stratification plane of an exfoliation film apply and dry a binder and forms a binder layer, it may be stuck with the plastic film with which the ionizing-radiation hardening resin layer was prepared. As the formation approach of a binder layer, especially, various approaches [be / no limit] can be used, for example, an air knife coater, a blade coating machine, a bar coating machine, a gravure coating machine, a roll coater, a curtain coating machine, a die coating machine, a knife coating machine, a screen coating machine, a MAIYA bar coating machine, a kiss coating machine, etc. are mentioned. In this invention, in order to raise the clear nature of an image, as for a binder layer, it is desirable to have transparency.

[0016] The front face of a binder layer may be covered with an exfoliation film. Moreover, with the release agent layer of a plastic film, detachability may be given by applying a remover on the surface of an opposite hand etc., and you may save by making a pressure sensitive adhesive sheet into a roll volume without using an exfoliation film. Thus, the front face of a binder layer can be protected. Various paper material, such as a film which can use various exfoliation films, for example, consists of various resin, such as polyethylene terephthalate, polybutylene terephthalate, polyethylene, polypropylene, and polyarylate, as an exfoliation film, and a polyethylene laminated paper, a polypropylene laminated paper, clay court paper, resin coat paper, glassine, can be used as a base material, and that by which exfoliation processing was performed to the plane of composition with the binder layer of this base material as occasion demands can be used. In this case, as an example of representation of exfoliation processing, formation of the remover layer which consists of removers, such as silicone system resin, long-chain alkyl system resin, and fluoro-resin, is mentioned. What is necessary is not to restrict especially the thickness of an exfoliation film but just to select it suitably.

[0017] In order to stick the pressure sensitive adhesive sheet for surface protections of this invention on adherend, it can carry out by stripping off the exfoliation film, when the exfoliation film is covered with the front face of the binder layer of a pressure sensitive adhesive sheet, and sticking the binder layer on the surface of adherend. After sticking the pressure sensitive adhesive sheet for surface protections on adherend, an ionizing-radiation hardening resin layer can be made to form on the surface of adherend by removing by the interface of an ionizing-radiation hardening resin layer and a release agent layer, removing the plastic film to which the release agent layer was attached, and changing into the condition

of having stuck the ionizing-radiation hardening resin layer and the binder layer on adherend.

[0018]

[Example] Next, an example explains this invention concretely. However, this invention is not limited at all by these examples. In addition, surface roughness (Ra) and a probe tuck were measured using the equipment of a degree, respectively.

Surface roughness: Surface roughness measuring device SAS-2010 mold (Product made from a ***** machine)

Probe tuck: Probe tuck circuit tester (product made from Physical science Industry)

[0019] The 2 organic-functions urethane acrylate (product [made from Kyoeisha Chemistry], product name "UF-503LN", number-average-molecular-weight 4900, solid content concentration 70 mass %) 100 mass section, (Example 1) as ultraviolet curing mold polyfunctional acrylate -- a pentaerythritol thoria chestnut rate (the product made from Toagosei Chemical industry --) As the product name "ARONIKKUSU M-30", three functional-groups, and solid content concentration 100 mass %100 mass section and a photopolymerization initiator 2-methyl -1-[4-(methylthio) phenyl]-2-morpholinopropane-1-ON (made in Tiba Speciality Chemicals --) The product name "IRUGA cure 907" 6.8 mass section was mixed, toluene was further mixed as a dilution solvent, solid content concentration was adjusted to 50 mass %, and the hardenability constituent was obtained. Next, coating of the acrylic modified alkyd resin is carried out to the front face of a polyethylene terephthalate film (38 micrometers in thickness) as a release agent. So that the thickness after hardening said hardenability constituent on the front face of the alkyd resin layer of a process film (the LINTEC Corp. make, product name "PET38AL-5") in which the alkyd resin layer (0.2 micrometers in thickness) was formed may be set to 10 micrometers It applied by my YABA No.16, ultraviolet rays (illuminance 120 mW/cm², quantity of light 300 mJ/cm²) were irradiated after desiccation for 1 minute at 80 degrees C at this, and the ultraviolet-rays hardening resin layer was formed. The probe tuck of the front face of an ultraviolet-rays hardening resin layer was 5mm of 0 g/phi. Next, the film with which the acrylic binder (the LINTEC Corp. make, product name "PA-T1") was applied to the front face of the exfoliation film (38 micrometers in the LINTEC Corp. make, a product name "SP-PET3811", thickness) which applied silicone system resin to the polyethylene terephthalate film, and the binder layer (5 micrometers in thickness) was formed in it was pasted together in said ultraviolet-rays hardening resin layer by this binder stratification plane, and the pressure sensitive adhesive sheet for surface protections was created.

[0020] (Example 2) In the example 1, the pressure sensitive adhesive sheet for surface protections was created like the example 1 as 2 organic-functions urethane acrylate except having used the product name "UF-803TN" (the product made from Kyoeisha Chemistry, number average molecular weight 8200, solid content concentration 70 mass %). The probe tuck of the front face of an ultraviolet-rays hardening resin layer was 5mm of 0 g/phi.

[0021] The 2 organic-functions urethane acrylate (product [made from Kyoeisha Chemistry], product name "UF-503LN", number-average-molecular-weight 4900, solid content concentration 70 mass %) 100 mass section, (Example 3) ultraviolet curing mold polyfunctional acrylate (the Nippon Kayaku Co., Ltd. make and a product name "KAYARAD DPHA" --) the mixture of number of functional groups 5 organic functions, and six organic functions, the solid content concentration 100 mass %35 mass section, and a photopolymerization initiator (made in Tiba Speciality Chemicals --) The product name "IRUGA cure 907" (above) 4.2 mass section was mixed, the partially aromatic solvent (a mixed mass ratio = 1/1) of 1-methoxy-2-propanol and methyl isobutyl ketone was further mixed as a dilution solvent, solid content concentration was adjusted to 50 mass %, and the hardenability constituent was obtained. Coating of the polyethylene resin is carried out to the front face of a polyethylene terephthalate film (38 micrometers in thickness). the process film (the LINTEC Corp. make --) with which the polyethylene resin layer (20 micrometers in thickness) to which embossing was furthermore performed was formed So that the thickness after hardening said hardenability constituent on the front face of the polyethylene resin layer of product name "PET38NA" surface roughness Ra=0.2 may be set to 10 micrometers It applied by my YABA No.16, ultraviolet rays (illuminance 120 mW/cm², quantity of light 300 mJ/cm²) were irradiated behind the bottom of desiccation for 1 minute at 80 degrees C at this,

and the ultraviolet-rays hardening resin layer was formed. The probe tuck of the front face of an ultraviolet-rays hardening resin layer was 5mm of 0 g/phi. The film with which the acrylic binder (the LINTEC Corp. make, product name "PA-T1") was applied to the front face of an exfoliation film (38 micrometers in the LINTEC Corp. make, a product name "SP-PET3811", thickness), and the binder layer (2 micrometers in thickness) was formed in it was pasted together in said ultraviolet-rays hardening resin layer by this binder stratification plane, and the pressure sensitive adhesive sheet for surface protections was created.

[0022] (Example 1 of a comparison) It applied by my YABA No.16, ultraviolet rays (illuminance 120mW/cm², quantity of light 300 mJ/cm²) were irradiated behind the bottom of desiccation for 1 minute at 80 degrees C at this, and the ultraviolet-rays hardening resin layer was formed in the front face of a polyethylene terephthalate film (50 micrometers in thickness) so that the thickness after hardening the hardenability constituent used in the example 1 might be set to 10 micrometers. The acrylic binder (the LINTEC Corp. make, product name "PA-T1") was applied to the front face of the opposite hand of the ultraviolet-rays hardening resin layer of a polyethylene terephthalate film in which the ultraviolet-rays hardening resin layer was formed, the binder layer (5 micrometers in thickness) was formed in it, further, the exfoliation film (38 micrometers in the LINTEC Corp. make, a product name "SP-PET3811", thickness) was pasted together on the front face of a binder layer, and the pressure sensitive adhesive sheet for surface protections was created in it.

[0023] (Example 2 of a comparison) In the example 1 of a comparison, as a hardenability constituent, toluene was mixed as a dilution solvent to ultraviolet curing mold polyfunctional acrylate (pentaerythritol thoria chestnut rate), and the pressure sensitive adhesive sheet for surface protections was created like the example 1 of a comparison except having used the hardenability constituent which adjusted solid content concentration to 50 mass %.

[0024] (Performance evaluation) The following assessment approach estimated the engine performance for the pressure sensitive adhesive sheet for surface protections created in the example and the example of a comparison, and the result was shown in a table 1.

The exfoliation film of the pressure sensitive adhesive sheet for <crease-proof bendability> surface protections was exfoliated, the ultraviolet-rays hardening resin layer was carried out outside, and it twisted around the iron bar with a diameter of 10mm, and the pressure sensitive adhesive sheet for surface protections of an example observed the existence of generating of a crack visually, after removing the process film, and it evaluated it by the following criteria.

O : -crack-initiation-less x : after the pressure sensitive adhesive sheet for surface protections of an example having removed the process film to lamination and a degree in the binder layer after removing an exfoliation film for the pressure sensitive adhesive sheet for surface protections on the front face of the image side of the color photography paper printed with the ink-jet color printer with crack initiation <visual clear nature>, and removing a process film, organic-functions assessment of the clear nature (shade of a color etc.) of the photograph when viewing from the include angle of 60 degrees was carried out.

O : clear nature fitness x : poor clear nature [0025] On the front face of the image side of the color photography paper (60-degree glossiness = 38) printed with the <surface glossiness> ink-jet color printer After removing an exfoliation film, the pressure sensitive adhesive sheet for surface protections in a binder layer Lamination, Next, the pressure sensitive adhesive sheet for surface protections of an example is JIS about 60-degree glossiness of the front face of the ultraviolet-rays hardening resin layer after removing a process film. According to K7105, it measured using the gloss measurement machine (the Nippon Denshoku Industries Co., Ltd. make, trade name "VG 2000").

The process film and exfoliation film of the pressure sensitive adhesive sheet for <total light transmission> surface protections were removed, and total light transmission was measured according to JISK7105 using the hazemeter (the Nippon Denshoku Industries Co., Ltd. make, trade name "NDH 2000").

[0026] The exfoliation film of the pressure sensitive adhesive sheet for <abrasion-proof nature> surface protections was removed, the binder layer was pasted together to the glass plate, subsequently, after the

pressure sensitive adhesive sheet for surface protections of an example removed the process film, after it ground the ultraviolet-rays hardening resin layer front face against steel wool #0000 the 9.8x10 to 3 N/mm load 2, it was observed visually, and the following criteria estimated it.

O : -- x: to which a blemish is not attached -- according to the hand lacing method (JIS K5400), the pencil degree of hardness was measured for the front face of the ultraviolet-rays hardening resin layer of the pressure sensitive adhesive sheet for <pencil degree-of-hardness> surface protections to which the blemish was attached.

[0027]

[A table 1]

	実施例 1	実施例 2	実施例 3	比較例 1	比較例 2
耐折れ曲げ性	○	○	○	○	×
目視鮮明性	○	○	○	×	×
表面光沢度	9 5	9 8	5 7	1 5 5	1 6 0
全光線透過率	91.7	91.6	90.8	89.8	89.6
耐擦傷性	○	○	○	○	○
鉛筆硬度	H	H	H	2 H	2 H

[0028] The front face of color photography paper has 60-degree glossiness as low as 38. If the pressure sensitive adhesive sheet for surface protections of an example is stuck on this color photography paper and a process film is exfoliated, glossiness will rise and texture will become good. However, when the pressure sensitive adhesive sheet for surface protections of the example of a comparison is stuck, glossiness goes up too much and clear nature falls rather by the reflected light etc.

[0029]

[Effect of the Invention] The pressure sensitive adhesive sheet for surface protections of this invention can give a water resisting property, chemical resistance, and abrasion-proof nature excellent in front faces, such as image papers, such as a photograph outputted by the printer, and can raise the clear nature of an image further.

[Translation done.]